CLAIMS

1. A compound which is a carbamate of formula (I):

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$$\begin{array}{c|c}
 & O \\
 & \\
 & \\
 & O
\end{array}$$

$$\begin{array}{c|c}
 & R1 \\
 & R2 \\
 & O
\end{array}$$

$$\begin{array}{c|c}
 & (I)
\end{array}$$

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wherein

R1 represents a group selected from phenyl, 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, benzyl, furan-2-ylmethyl, furan-3-ylmethyl, thiophen-3-ylmethyl;

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R2 represents a group selected from optionally substituted lower alkyl, optionally substituted lower alkenyl, optionally substituted lower alkynyl, saturated or unsaturated cycloalkyl, saturated or unsaturated cycloalkylmethyl, phenyl, benzyl, phenethyl, furan-2-ylmethyl, thiophen-2-ylmethyl, thiophen-3-ylmethyl, pyridyl, and pyridylmethyl; wherein the carbocyclic moieties in the cycloalkyl, cycloalkylmethyl, phenyl, benzyl or phenethyl groups can be optionally bridged or fused to another saturated, unsaturated or aromatic carbocyclic moiety or to a cyclic moiety comprising carbon atoms and 1 or 2 oxygen atoms;

the cyclic groups present in R1 and R2 being optionally substituted by one, two or three substituents selected from halogen, straight or branched, optionally substituted lower alkyl, hydroxy, straight or branched, optionally substituted lower alkoxy, -SH, straight or branched optionally substituted lower alkylthio, nitro, cyano, -NR'R", -CO₂R', -C(O)-NR'R", -N(R"')C(O)-R', -N(R"')-C(O)NR'R", wherein R', R" and R" each independently represents a hydrogen atom or a straight or branched, optionally substituted lower alkyl

group;

p is 1 or 2 and the carbamate group is attached at positions 2, 3 or 4 of the azabicyclic ring,

group or R' and R" together with the atom to which they are attached form a cyclic

and pharmaceutically acceptable salts thereof, including quaternary ammonium salts of formula (II)

B —
$$(CH_2)_n$$
— A — $(CH_2)_m$ — N $(CH_2)_p$ O N R2

X (II)

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wherein R1, R2 and p are as defined above;

m is an integer from 0 to 8;

10 n is an integer from 0 to 4;

A represents a group selected from -CH₂-, -CH=CR'-, -CR'=CH-, -CR'R"-, -C(O)-, -O-, -S-, -S(O)-, -S(O)₂- and -NR'-, wherein R' and R" are as defined above;

- B represents a hydrogen atom, or a group selected from straight or branched, optionally substituted lower alkyl, hydroxy, straight or branched, optionally substituted lower alkoxy, cyano, nitro, -CH=CR'R", -C(O)OR', -OC(O)R', -SC(O)R', -C(O)NR'R", -NR'C(O)OR", -NR'C(O)NR", cycloalkyl, phenyl, naphthanelyl, 5,6,7,8-tetrahydronaphthanelyl, benzo[1,3]dioxolyl, heteroaryl or heterocyclyl; R' and R" being as defined above; and wherein the cyclic groups represented by B are optionally substituted by one, two or three substitutuents selected from halogen, hydroxy, straight or branched, optionally substituted lower alkyl, phenyl, -OR', -SR', -NR'R", -NHCOR', -CONR'R", -CN, -NO₂ and -COOR'; R' and R" being as defined above;
- 25 X represents a pharmaceutically acceptable anion of a mono or polyvalent acid;

including all individual stereoisomers of formulae (I) or (II) and mixtures thereof;

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with the proviso that the compound of formula (I) is not one of

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Diphenylcarbamic acid 1-azabicyclo[2.2.2]oct-3-yl ester Ethylphenylcarbamic acid 1-azabicyclo[2.2.2]oct-3-yl ester

2. A compound of formula (I) or formula (II) according to claim 1, wherein when the cyclic group present in R1 is unsubstituted or has only one substitutent R2 has at least one substituent.

- 3. A compound of formula (I) or formula (II) according to claim 1 wherein when R2 is not substituted the cyclic group present in R1 has at least two substituents.
 - 4. A compound of formula (I) according to any one of daims 1 to 3, wherein when:

10 p is 2;

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the carbamate group is attached at position 3 of the azabicyclic ring;

and R1 is an unsubstituted indanyl group or a phenyl group, which is optionally substituted with one or two substitutents selected from chlorine, fluorine, bromine, methyl, hydroxy and cyano;

then R2 cannot be one of: unsubstituted cyclopropylmethyl; unsubstituted cyclobutylmethyl; unsubstituted cyclopentylmethyl; cyclohexylmethyl optionally substituted with a methyl or an isopropenyl group; unsubstituted cyclohexenyl; unsubstituted norbornenyl; unsubstituted bicyclo[2,2,1]heptanyl; unsubstituted benzo[1,3]dioxolyl; unsubstituted 2,3-dihydrobenzo[1,4]dioxinyl; unsubstituted benzyl; a benzyl group which is substituted with one or two substituents selected from fluorine, chlorine, bromine, methoxy, methyl, trifluoromethyl, ethyl, tertbutyl, hydroxy, hydroxymethyl, cyano, aminocarbonyl, trifluoromethoxy, benzyloxy, isopropyloxy; and a benzyl group which is substituted with three fluorine atoms.

5. A compound of formula (I) according to any one of claims 1 to 3 wherein R1 represents a group selected from 2-furyl, 3-furyl, 2-thienyl, 3-thienyl, benzyl, furan-2-ylmethyl, furan-3-ylmethyl, thiophen-2-ylmethyl; thiophen-3-ylmethyl; the cyclic groups present in R1 being optionally substituted by one, two or three substituents selected from halogen, straight or branched, optionally substituted lower alkyl, hydroxy, straight or branched, optionally substituted lower alkoxy, -SH, straight or branched optionally substituted lower alkylthio, nitro, cyano, -NR'R", -CO₂R', -C(O)-NR'R", -N(R"")C(O)-R', -N(R"")-C(O)NR'R", wherein R', R" and R"" each independently represents a hydrogen atom or a straight or branched, optionally substituted lower alkyl group or R' and R" together with the atom to which they are attached form a cyclic group;

6. A compound of formula (I) according to any one of claims 1 to 3 wherein R2 represents an optionally substituted group selected from lower alkyl, lower alkenyl, lower alkynyl, saturated or unsaturated cycloalkyl, phenyl, phenethyl, furan-2-ylmethyl, furan-3-ylmethyl, thiophen-3-ylmethyl, pyridyl, and pyridylmethyl or a saturated or unsaturated cycloalkylmethyl group which has at least one substituent and is selected from substituted cyclopropylmethyl, substituted cyclobutylmethyl and substituted cyclopentylmethyl; the substituents of the cyclic groups present in R2 being one, two or three substituents selected from halogen, straight or branched, optionally substituted lower alkyl, hydroxy, straight or branched, optionally substituted lower alkoxy, -SH, straight or branched optionally substituted lower alkylthio, nitro, cyano, -NR'R", -CO₂R', -C(O)-NR'R", -N(R"")C(O)-R', -N(R"")-C(O)NR'R", wherein R', R" and R" each independently represents a hydrogen atom or a straight or branched, optionally substituted lower alkyl group or R' and R" together with the atom to which they are attached form a cyclic group;

7. A compound of formula (II) according to any one of claims 1 to 3 wherein when

p is 2;

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the carbamate group is attached at position 3 of the azoniabicyclic ring having (3R)-configuration;

R1 is a phenyl group which is optionally substituted with a fluorine atom or a methyl group;

R2 is an unsubstituted cyclohexylmethyl group or a benzyl group which is optionally substituted with one or three fluorine atoms:

30 and X iodine;

then, the sequence B-(CH₂)_n-A-(CH₂)_m- cannot be a methyl group.

- 8. A compound of formula (II) according to any one of claims 1 to 3 with the proviso that the said compound is not one of:
- (3R)-3-(Benzylphenylcarbamoyloxy)-1-methyl-1-azoniabicyclo[2.2.2]octane

iodide

(3R)-3-[(4-Fluorobenzyl)phenylcarbamoyloxy]-1-methyl-1-azoniabicyclo[2.

- 2.2]octane iodide
- (3R)-3-(Benzyl-o-tolylcarbamoyloxy)-1-methyl-1-azoniabicyclo[2.2.2]octane iodide
- 5 (3R)-1-Methyl-3-[o-tolyl-(2,4,5-trifluorobenzyl)carbamoyloxy]-1azoniabicyclo[2.2.2]octane iodide
 - (3R)-3-[(4-Fluorobenzyl)-m-tolylcarbamoyloxy]-1-methyl-1-azoniabicyclo[2.2.2]octane iodide
 - (3R)-3-[Benzyl-(2-fluorophenyl)carbamoyloxy]-1-methyl-1-azoniabicyclo[2.2.2]octane iodide
 - (3R)-3-[Cyclohexylmethyl-(2-fluorophenyl)carbamoyloxy]-1-methyl-1-azoniabicyclo[2.2.2]octane iodide
- 9. A compound of formula (II) according to any one of claims 1 to 3, 7 or 8 wherein R1 represents a group selected from phenyl, 2-thienyl, 3-thienyl, thiophen-2-ylmethyl, thiophen-3-ylmethyl, furan-2-ylmethyl or furan-3-ylmethyl, the cyclic groups present in R1 being optionally substituted with one to three substitutents selected from fluorine, chlorine, bromine, methyl, methoxy, trifluoromethyl, ethyl, tert-butyl, hydroxy and cyano.

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- 10. A compound of formula (II) according to claim 9 wherein R1 represents a group selected from phenyl, 2-fluorophenyl, 3-fluorophenyl, 4-fluorophenyl, 3-methylphenyl, 4-methylphenyl, 2,5-difluorophenyl, 2,6-difluorophenyl, 2,4,5-trifluorophenyl, 5-methylfuran-2-ylmethyl, 4-fluoro-2-methylphenyl, 3-fluoro-4-methoxyphenyl, 3-methylthiophen-2-ylmethyl, 4,5-dimethyl-thiophen-2-ylmethyl, thiophen-3-ylmethyl, 5-methylfuran-3-ylmethyl, and 2,5-dimethyl-furan-3-ylmethyl,
- 11. A compound of formula (II) according to any one of claims 1 to 3 or 7 to 10 wherein R2 represents a pent-4-enyl, pentyl, butyl, allyl, benzyl, thiophen-2-ylmethyl, thiophen-3-ylmethyl, furan-2-ylmethyl, furan-3-ylmethyl, phenethyl, cyclopentyl, cyclohexyl or cyclohexylmethyl group, the cyclic groups present in R2 being optionally substituted with one to three substitutents selected from fluorine, chlorine, bromine, methyl, methoxy, trifluoromethyl, ethyl, tert-butyl, hydroxy and cyano.

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12. A compound according to claim 11 wherein R2 represents a group selected from 3-fluorobenzyl, 2,4,5-trifluorobenzyl, 3,4,5-trifluorobenzyl, 5-Bromothiophen-2-ylmethyl,

3,4-dimethoxyphenylethyl, 3-methylthiophen-2-ylmethyl, thiophen-3-ylmethyl, 4-bromo-5-methylthiophen-2-ylmethyl, 4,5-dimethylfuran-2-ylmethyl, furan-3-ylmethyl, 2-fluoro-4-methoxybenzyl, 2-(4-fluorophenyl)ethyl, butyl, pent-4-enyl and cyclopentyl.

13. A compound of formula (II) according to any one of claims 1 to 3 or 7 to 12 wherein A is –CH₂-, m and n are both 0, and B represents a group selected from straight or branched, optionally substituted lower alkyl, hydroxy, straight or branched, optionally substituted lower alkoxy, cyano, nitro, -CH=CR'R", -C(O)OR', -OC(O)R', -SC(O)R', -C(O)NR'R", -NR'C(O)OR", -NR'C(O)NR", cycloalkyl, phenyl, naphthanelyl, 5,6,7,8-tetrahydronaphthanelyl, benzo[1,3]dioxolyl, heteroaryl or heterocyclyl; R' and R" being as defined in claim1; and wherein the cyclic groups represented by B are optionally substituted by one, two or three substitutuents selected from halogen, hydroxy, straight or branched, optionally substituted lower alkyl, phenyl, -OR', -SR', -NR'R", -NHCOR', -CONR'R", -CN, -NO₂ and -COOR', R' and R" being as defined above;

14. A compound of formula (II) according to any one of claims 1 to 3 or 7 to 12 wherein A is $-CH_{2^-}$, B is as defined in claim 1 and at least one of m or n is not 0.

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15. A compound of formula (II) according to any one of claims 1 to 3 or 7 to 12 wherein
20 B represents a thiophen-2-yl group or a phenyl group which is optionally substituted
with one to three substituents selected from halogen atoms, or hydroxy, methyl, CH₂OH, -OMe, -NMe₂, -NHCOMe, -CONH₂, -CN, -NO₂, -COOMe, or -CF₃ groups.

16. A compound according to claim 15, wherein B represents a phenyl, 4-fluorophenyl,3-hydroxyphenyl or thiophen-2-yl group.

17. A compound of formula (II) according to any one of claims 1 to 3, 7 to 12, 15 or 16 wherein n=0 or 1; m is an integer from 1 to 6; and A represents a -CH₂-, -CH=CH-, -CO-, -NMe-, -O- or -S- group.

18. A compound of formula (II) according to claim 17, wherein m is 1, 2 or 3 and A represents a -CH₂-, -CH=CH-, or -O- group.

19. A compound of formula (II) according to any one of claims 1 to 3 or 7 to 12 wherein the sequence B-(CH₂)_n-A-(CH₂)_m- represents a group selected from 3-phenoxypropyl, 2-phenoxyethyl, 3-phenylallyl, phenethyl, 3-phenylpropyl, 3-(3-hydroxyphenoxy)propyl,

3-(4-fluorophenoxy)propyl, 3-thiophen-2-ylpropyl, allyl, heptyl, 3-cyanopropyl and methyl.

20. A compound of formula (II) according to any one of claims 1 to 3 or 7 to 19 wherein X represents a chloride, bromide, trifluoroacetate or methanesulphonate anion.

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- 21. A compound of formula (I) or (II) according to any one of the preceding claims, wherein p is 2.
- 22. A compound of formula (I) or (II) according to any one of the preceding claims, wherein the azabicyclic ring is substituted in the 3-position.
 - 23. A compound of formula (I) or (II) according to claim 22 wherein the carbon at the 3-position of the azabicyclic ring has R configuration.
 - 24. A compound of formula (I) or (II) according to claim 22 wherein the carbon at the 3-position of the azabicyclic ring has S configuration.
- 25. A compound according to any one of the preceding claims, which is a single isomer.
 - 26. A compound of formula (I) according to claim 1 which is one of:
- [2-(3,4-Dimethoxyphenyl)ethyl]-(5-methylfuran-2-ylmethyl)carbamic acid (3R)-1azabicyclo[2:2.2]oct-3-yl ester
 (5-Bromothiophen-2-ylmethyl)-(2,4,5-trifluorophenyl)carbamic acid (3R)-1azabicyclo[2.2.2]oct-3-yl ester
 (4-Fluoro-2-methylphenyl)-(3-methylthiophen-2-ylmethyl)carbamic acid (3R)-1azabicyclo[2.2.2]oct-3-yl ester
- 30 (3-Fluoro-4-methoxyphenyl)thiophen-3-ylmethylcarbamic acid (3R)-1azabicyclo[2.2.2]oct-3-yl ester Thiophen-3-ylmethyl-(2,4,5-trifluorobenzyl)carbamic acid (3R)-1-azabicyclo[2.2.2]oct-3yl ester
- (4-Bromo-5-methylthiophen-2-ylmethyl)-(3-methylthiophen-2-ylmethyl)carbamic acid (3R)-1-azabicyclo[2.2.2]oct-3-yl ester (4,5-Dimethylfuran-2-ylmethyl)-(5-methylfuran-2-ylmethyl)carbamic acid (3R)-1-

azabicyclo[2.2.2]oct-3-vl ester

Furan-3-ylmethyl-(5-methyl-2-trifluoromethylfuran-3-ylmethyl)carbamic acid (3R)-1azabicyclo[2.2.2]oct-3-yl ester (2,5-Dimethylfuran-3-ylmethyl)-(2-fluoro-4-methoxybenzyl)carbamic acid (3R)-1azabicyclo[2.2.2]oct-3-yl ester

- [2-(4-Fluorophenyl)ethyl]-(3-methylthiophen-2-ylmethyl)carbamic acid (3R)-1azabicyclo[2.2.2]oct-3-yl ester Butyl-(2,5-difluorophenyl)carbamic acid (3R)-1-azabicyclo[2.2.2]oct-3-yl ester (2,6-Difluorophenyl)pent-4-enylcarbamic acid (3R)-1-aza-bicyclo[2.2.2]oct-3-yl ester Cyclopentyl-(4,5-dimethylthiophen-2-ylmethyl)carbamic acid (3R)-1azabicyclo[2.2.2]oct-3-yl ester
- 10 (5-Ethylthiophen-2-ylmethyl)-(3-methylthiophen-2-ylmethyl)carbamic acid (3R)-1-azabicyclo[2.2.2]oct-3-yl ester
 - 27. A compound of formula (II) according to claim 1 which is one of.

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- (3R)-3-[(3-Fluorobenzyl)-(3-fluorophenyl)carbamoyloxy]-1-(2-phenoxyethyl)-1azoniabicyclo[2,2,2]octane bromide (3R)-3-[(3-Fluorobenzyl)-(3-fluorophenyl)carbamoyloxyl-1-(3-phenylpropyl)-1azoniabicyclo[2.2.2]octane bromide
- 20 (3R)-1-(2-Phenoxyethyl)-3-[m-tolyl-(2,4,5-trifluorobenzyl)carbamovloxy]-1azoniabicyclo[2.2.2]octane bromide (3R)-1-(3-Phenylpropyl)-3-[m-tolyl-(2,4,5-trifluorobenzyl)carbamoyloxy]-1azoniabicyclo[2.2.2]octane bromide (3R)-3-[(3-Fluorophenyl)-(3,4,5-trifluorobenzyl)carbamovloxyl-1-(2-phenoxyethyl)-1-
- (3R)-1-Allyl-3-[[2-(3,4-dimethoxyphenyl)ethyl]-(5-methylfuran-2ylmethyl)carbamoyloxy]-1-azoniabicyclo[2.2.2]octane bromide (3R)-3-[(5-Bromothiophen-2-ylmethyl)-(2,4,5-trifluorophenyl)carbamoyloxy]-1-(3phenoxypropyl)-1-azoniabicyclo[2.2.2]octane trifluoroacetate

azoniabicyclo[2.2.2]octane bromide

- (3R)-3-[[2-(3,4-dimethoxyphenyl)ethyl]-(5-methylfuran-2-ylmethyl)carbamoyloxy]-1-(4ethoxycarbonylbutyl)-1-azoniabicyclo[2.2.2]octane trifluoroacetate (3R)-3-[(4-Fluoro-2-methylphenyl)-(3-methylthiophen-2-ylmethyl)carbamoyloxyl-1-(2phenoxyethyl)-1-azoniabicyclo[2.2.2]octane trifluoroacetate (3R)-3-[(3-Fluoro-4-methoxyphenyl)thiophen-3-ylmethylcarbamoyloxy]-1-(3-
- 35 phenylallyl)-1-azoniabicyclo[2.2.2]octane trifluoroacetate (3R)-1-Phenethyl-3-[thiophen-3-ylmethyl-(2,4,5-trifluorobenzyl)carbamoyloxy]-1azoniabicyclo[2.2.2]octane trifluoroacetate

(3R)-3-[(4-Bromo-5-methylthiophen-2-ylmethyl)-(3-methylthiophen-2-ylmethyl)carbamoyloxy]-1-(3-phenylpropyl)-1-azoniabicyclo[2.2.2]octane trifluoroacetate

- (3R)-3-[(4,5-Dimethylfuran-2-ylmethyl)-(5-methylfuran-2-ylmethyl)carbamoyloxy]-1-[3-(3-hydroxyphenoxy)propyl]-1-azoniabicyclo[2.2.2]octane trifluoroacetate
- (3R)-1-[3-(4-Fluorophenoxy)propyl]-3-[furan-3-ylmethyl-(5-methyl-2-trifluoromethylfuran-3-ylmethyl)carbamoyloxy]-1-azoniabicyclo[2.2.2]octanetrifluoroacetate
- (3R)-3-[(2,5-Dimethylfuran-3-ylmethyl)-(2-fluoro-4-methoxybenzyl)carbamoyloxy]-1-(3-thiophen-2-ylpropyl)-1-azoniabicyclo[2.2.2]octane trifluoroacetate
 - (3R)-1-Allyl-3-[2-(4-fluorophenyl)ethyl]-(3-methylthiophen-2-ylmethyl)carbamoyloxy]-1-azoniabicyclo[2.2.2]octane trifluoroacetate
 - (3R)-3-[Butyl-(2,5-difluorophenyl)carbamoyloxy]-1-heptyl-1-azoniabicyclo[2.2.2]octane trifluoroacetate
- 15 (3R)-1-(3-cyanopropyl)-3-[(2,6-difluorophenyl)pent-4-enylcarbamoyloxy]-1-azoniabicyclo[2.2.2]octane trifluoroacetate
 - (3R)-3-[Cyclopentyl-(4,5-dimethylthiophen-2-ylmethyl)carbamoyloxy]-1-methyl-1-azoniabicyclo[2.2.2]octane trifluoroacetate
 - (3R)-3-[(3-Fluorophenyl)-(3,4,5-trifluorobenzyl)carbamoyloxy]-1-(3-phenylpropyl)-1-
 - azoniabicyclo[2.2.2]octane bromide

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- (3R)-3-[(5-Ethylthiophen-2-ylmethyl)-(3-methylthiophen-2-ylmethyl)carbamoyloxy]-1-(3-phenylpropyl)-1-azoniabicyclo[2.2.2]octane bromide
- (3R)-3-[[2-(3,4-dimethoxyphenyl)ethyl]-(5-methylfuran-2-ylmethyl)carbamoyloxy]-1-(4-ethoxycarbonylbutyl)-1-azoniabicyclo[2.2.2]octane formate
- 25 (3R)-3-[(4-Fluoro-2-methylphenyl)-(3-methylthiophen-2-ylmethyl)carbamoyloxy]-1-(2-phenoxyethyl)-1-azoniabicyclo[2.2.2]octane bromide (3R)-3-[(3-Fluoro-4-methoxyphenyl)thiophen-3-ylmethylcarbamoyloxy]-1-(3
 - phenylallyl)-1-azoniabicyclo[2.2.2]octane bromide
- (3R)-1-Allyl-3-[2-(4-fluorophenyl)ethyl]-(3-methylthiophen-2-ylmethyl)carbamoyloxy]-1-30 azoniabicyclo[2.2.2]octane bromide
 - 28. A pharmaceutical composition comprising a compound according to any one of claims 1 to 27 in admixture with a pharmaceutically acceptable carrier or diluent.
- 29. A compound according to any one of claims 1 to 27 for the treatment of a pathological condition or disease susceptible to amelioration by antagonism of M3 muscarinic receptors.

30. Use of a compound according to any one of claims 1 to 27 in the manufacture of a medicament for the treatment of a pathological condition or disease susceptible to amelioration by antagonism of M3 muscarinic receptors.

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- 31. Use according to claim 30 wherein the pathological condition is a respiratory, urological or gastrointestinal disease or disorder.
- 32. A method for treating a subject afflicted with a pathological condition or disease
 susceptible to amelioration by antagonism of M3 muscarinic receptors, which
 comprises administering to said subject an effective amount of a compound as defined
 in any one of claims 1 to 27.
- 33. A method according to claim 32 wherein the pathological condition is a respiratory, urological or gastrointestinal disease or disorder.
 - 34. A combination product comprising
 - (i) a compound according to any one of claims 1 to 27; and
- (ii) another compound effective in the treatment of a respiratory, urological or
 gastrointestinal disease or disorder
 for simultaneous, separate or sequential use.
 - 35. A combination product according to claim 34 comprising
 - (i) a compound according to any one of claims 1 to 27; and
- (ii) a β₂ agonist, steroid, antiallergic drug, phosphodiesterase IV inhibitor and/or leukotriene D4 (LTD4) antagonist for simultaneous, separate or sequential use in the treatment of a respiratory disease.